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BEFORE THE BOARD OF PATENT APPEALS

AND INTERFERENCES

Application Number: 10/033,451

Filing Date: December 27, 2001

Appellant(s): KAHOLA, MIKA

Geza C. Ziegler

For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 8/9/2007 appealing from the Office action mailed 7/5/2006.

(1) Real Party in Interest

The real Party in interest has been identified in the Appeal Brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,072,990	Agrawal et al.	6-2000
5,687,290	Lewis	11-1997
6,654,359	La Porta et al.	11-2003

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 2-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal et al. in view of La Porta et al in view of Lewis (US Patent #6,072,990, referred to as **Agrawal**; US Patent #6,654,359, referred to as **La Porta**; US Patent #5,687,290, referred to as **Lewis**)

Claim 2

In the method of claim 17 as taught by Agrawal, a target value is determined to the packet error rate aimed to be kept substantially the same as the target value, and the difference between the packet error rate and target value is used as control variable in the method (**Agrawal**: col.4, lin.30-45, Examiner's Note: acceptable word error range implies that there is a target value and the difference between the actual error rate and the target value, defined as error range, is acceptable).

Claim 3

The method of claim 17 as taught by Agrawal, measures packet error rate (**Agrawal**: abstract, lin.4-12) and change of packet error rate (**Agrawal**: col.9, lin.5-7) for inputs of the method. The modified Agrawal's method by adding Lewis's fuzzy control logic takes packet error rate and the change of packet error rate as inputs represented as fuzzy control values, and a set of fuzzy rules is arranged, which are used for determining the effects of the control values to the modulation mode used as a controllable value. (**Agrawal**: abstract, lin.1-14; EN: Agrawal measures packet error rate and the change of packet error rate as inputs to Lewis' fuzzy inference engine that produces control outputs such as power level and modulation modes as taught by Agrawal).

Claims 4-6

Applicant's algorithm as set forth in claims 4-6 has been considered and is given little patentable weight. The algorithm is commonly taught in texts such as Kosko "Neural Network and Fuzzy Systems and Dynamical Systems Approach to Machine Intelligence" page 306-322) and widely used such as Shen ("New Mobility Profile Prediction: An Adaptive Fuzzy Inference Approach" page 370), therefore it is merely a matter of engineering choice in design and not considered to provide any new or unexpected result.

Furthermore, one of ordinary skill in the art would have provided the algorithm, as a design choice taught by Kosko, for the purpose of implementing the fuzzy inference engine for the fuzzy logic taught by Lewis. As a result it would have been obvious to one

of ordinary skill in the art at the time of applicants' invention further modify the system taught by Agrawal by choosing the algorithm taught by Kosko to implement the fuzzy inference engine taught by Lewis.

Claim 7

In the modified method of Lewis as defined in claims 3-6 in line with the method of claim 17 taught by Agrawal, the fuzzy control outputs include modulation modes, as in claim 17, each of which is defined as an individual index as in claim 6. The method of Lewis in view of Kosko has the following steps: An initiation phase, wherein one of said indexes is selected in order to select the modulation mode used in communication selection (It is inherent in the algorithm taught by Kosko that indexes are chosen to be able to use the algorithm in claim 5. In the context of claim 17 and 5, the indexes represent outputs that include modulation mode); a computing phase, in which the difference of the packet error rate from the target value (**Agrawal:** col.4, lin.36), and the change rate of packet error rate are calculated (**Agrawal**: col.9, lin.5; EN: to response the change of error rate must be calculated); a fuzzy control phase, in which fuzzy control is used for defining the index change of the modulation mode and the modulation mode is selected according to the calculated new index. (It is inherent in the algorithm taught by Kosko that the fuzzy logic algorithm calculates the new index that represents fuzzy outputs that include modulation mode).

Claim 8

In the method of claim 7, the calculating phase and fuzzy control phase are repeated. (**Agrawal**: col.6, lin.17-22; EN: Lewis's fuzzy control logic and Kosko's

algorithm are used in the context of Agrawal, therefore the calculating phase and fuzzy control phase are repeated).

Claims 9-11

In the method of claim 17, Agrawal teaches a transmitter that encodes transmitted data from encoding schemes that includes modulation modes. The operating point of transmitter is defined by power code that anticipates transmission power. The selected modulation modes and transmission power will produce desired packet error rate (**Agrawal**: col.5, lin.65-67; col.6, lin.1-22; EN: the encoding schemes are implemented using Lewis's fuzzy logic as taught in claim 17).

Claim 12-14

Claims 12-14 are systems claims that correspond to method claims 17 and 2-3 respectively. Therefore claims 12-14 are rejected under the same rationale as cited in the rejection of rejected claims 17 and 2-3 respectively.

Claim 15

Agrawal teaches a system for transmitter and receiver pair in wireless communication network as discussed in claim 17. Even though Agrawal does not mention explicitly an access point controller in the system, Agrawal does not limit the number of transmitter-receiver pairs and the type of communication terminals (**Agrawal**: col.5, lin.60-64) Should the need of an access pointer controller arise in the system taught by Agrawal, it would have been obvious for an ordinary skill in the art at the time of the invention to modify one of terminals in the communication system taught by Agrawal into an access point controller as one type on communication terminal in the

system taught by Agrawal. By treating an access pointer as a wireless terminal, claim 15 is rejected in the same rationale as the rejection rejected in claim 16.

Claim 16

Agrawal teaches a wireless terminal (**Agrawal**: Fig. 1 the transmitter 12 or receiver 13), comprising means for transmitting packet information at least partly wirelessly in a communication system arranged between the wireless terminal and a second communication device (**Agrawal**: Fig. 1 is the communication system with two communication devices communicating wirelessly), means for defining packet error rate (**Agrawal**: col.1, lin.54-64), and means for selecting modulation modes (**Agrawal**: col.6, lin.1).

Agrawal fails to teach selecting modulation modes using fuzzy control. Lewis teaches means for using fuzzy control for selecting modulation mode and at least packet error rate being used as one fuzzy variable as in claim 17. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention to modify the system taught by Agrawal by adding the fuzzy control logic as taught by Lewis in the same rationale as explained in claim 17.

Claim 17

Agrawal teaches a method for performing link adaptation in a communication system (**Agrawal**: Abstract, lin.1-3; Fig.1. Determining the operating point is performing link adaptation), the method comprising: forming a connection to transfer information at least partly wirelessly between two communication devices (**Agrawal**: Abstract, lin.1-3; Fig.1); determining a packet error rate (**Agrawal**: col.1, lin.54-67, col.2, lin.1-13; EN: If

data is transferred in packet of words, packet error rate and word error rate are considered to be the same); and selecting a modulation mode for the connection from at least two different modulation modes (**Agrawal**: col.5, lin.65-67; col.6, lin.1-2; EN: encoding schemes include modulation modes);

Agrawal does not teach forming packets from the information to be transferred via the connection, said packets comprising a header and a payload.

La Porta teaches forming packets from the information to be transferred via the connection, said packets comprising a header and a payload (**La Porta**: col.34, lin.9-17).

It would have been obvious to one of ordinary skill in the arts at the time of the applicant's invention to modify the teachings of Agrawal by incorporating forming packets from the information to be transferred via the connection, said packets comprising a header and a payload as taught by La Porta for the purpose of conveying in the message information describing the destination address (header) where the message (payload) is to be received.

Agrawal does not teach said selecting a modulation mode comprises using fuzzy control; and using said packet error rate as one variable for said fuzzy control.

Lewis teaches said selecting a modulation mode comprises using fuzzy control (**Lewis**: col.3, lin.24-34; EN: modulation mode is a network control parameter); and using said packet error rate as one variable for said fuzzy control (**Lewis**: col.3, lin.20-30; col.3, lin.42-47; col.7, lin.63-67, col.8, lin.1-7; EN: packet error rate is an operating parameter of the network).

It would have been obvious to one of ordinary skill in the arts at the time of the applicant's invention to modify the combined teachings of Agrawal and La Porta by having fuzzy control to select the modulation mode using the packet error rate as a variable as taught by Lewis for the purpose of providing a more flexible approach in selecting the way that data is transmitted on networks that operate under unpredictable or rapidly changing domains.

(10) Response to Argument

In re pg. 9, the Appellant argues: "It is well settled that in order to establish a prima facie case for obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, without reference to the disclosure of this application. (MPEP Sec. 2142).

In response, As discussed in MPEP § 2143.01, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine reference teachings. The Federal Circuit has produced a number of decisions overturning obviousness rejections due to a lack of suggestion in the prior art of the desirability of combining references, as discussed in the aforementioned section. Motivation for combining prior art references need not be explicitly found in the references themselves, and the Examiner may provide explanation based on logic and sound scientific reasoning that will support holding of obviousness. Moreover, the court decision in KSR International Co. v. Teleflex Inc., 550 U.S.-,82 USPQ2d 1385 (2007) forecloses the argument that a

specific teaching, suggestion or motivation in the references is required to support a finding of obviousness. See the recent board decision Ex parte Smith,--USPQ2d--, slip op. at 20, (Bd. Pat. App. & Interf. June 25, 2007) (citing KSR, 82 USPQ2d at 1936).

In re pg 9, the Appellant argues: "The examiner relies primarily on the disclosure of the cited reference Agrawal to support the rejection based on obviousness. The cited reference Agrawal fails to disclose or suggest the selection of a modulation mode. The cited reference fails to disclose or suggest the use of fuzzy logic in any manner. The cited reference fails to disclose or suggest a fuzzy logic selection process using packet error rate. The cited reference fails to disclose or suggest the transfer of packets comprising a header and a payload".

In response the Examiner notes that Applicant's arguments amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. As stated in the rejection above, Agrawal teaches the selection of an encoding scheme from a plurality of encoding schemes at column 5, line 65 to column 6, line 2. An encoding scheme is the same as a modulation mode since modulation is how the data is coded in order to send it through the transmission medium. As defined in the IEEE dictionary, encoding is a representation of data bits and nondata information for signal transmission across a serial communications medium. Therefore, selecting a modulation scheme and selecting an encoding scheme is equivalent.

As for the argument of the use of fuzzy logic, it should be noted that the claim recites "using fuzzy control" and therefore this limitation is not claimed. As stated in the

rejection above, this limitation was rejected with the teaching of Lewis at column 3, lines 24-34. Motivation to combine the references has been provided and no evidence has been provided as to why the combination fails to disclose the claim limitation.

As for the argument that Agrawal fails to disclose a fuzzy logic selection process using packet error rate, the Examiner notes that the claim recites "using said packet error rate as one variable for said fuzzy control" and therefore the limitation argued by the Applicant is not claimed. The limitation recited in the claim was rejected using the teachings of Lewis at column 3, lines 24-34. The Examiner has provided an explanation on how he considers the reference to read on the limitation claimed and has also provided a motivation to combine the references.

As for the argument that Agrawal fails to teach "the transfer of packets comprising a header and a payload", it should be noted that the claim recites: "forming packets from the information to be transferred via the connection, said packets comprising a header and a payload". This limitation has been rejected with the teachings of La Porta at column 34, lines 9-17. Motivation to combine the references has been provided and no evidence has been provided as to why the combination fails to disclose the claim limitation.

In re. pg. 10, the Appellant argues: "When, in the system of the subject application, modulation mode is selected, the process involves data speed, modulation method, coding rate and other parameters. Significantly different parameters are involved in the system of Agrawal, namely, only transmission power and/or error code. The reference Agrawal, therefore, does not teach the selection of modulation mode".

In response, the Examiner notes that the claim only recites: "selecting a modulation mode for the connection from at least two different modulation modes" and therefore the limitations described above by the Appellant are not claimed. In the broadest reasonable sense, a modulation mode is simply how the data is coded in order to transmit it through a medium. Agrawal discloses the selection of an encoding scheme from a plurality of encoding schemes at column 5, line 65 to column 6, line 2. An encoding scheme and a modulation mode are equivalent in light of the definition for encoding in the IEEE dictionary set forth above.

In re pg. 10, the Appellant argues the combination of Agrawal and Lewis, specifically that nothing in the Agrawal reference suggests that the incorporation of the teachings of Lewis within the system of Agrawal would be advantageous and that Agrawal teaches away from the combination.

In response, as stated above motivation for combining prior art references need not be explicitly found in the references themselves, and the Examiner may provide explanation based on logic and sound scientific reasoning that will support holding of obviousness. Moreover, the court decision in KSR International Co. v. Teleflex Inc., 550 U.S.-,82 USPQ2d 1385 (2007) forecloses the argument that a specific teaching, suggestion or motivation in the references is required to support a finding of obviousness. See the recent board decision Ex parte Smith,--USPQ2d--, slip op. at 20, (Bd. Pat. App. & Interf. June 25, 2007) (citing KSR, 82 USPQ2d at 1936).

Furthermore, applicant cannot show non-obvious by attacking the references individually where as here the rejections are based on a combination of references see In re Keller USPQ 871 (CCPA 1981).

However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is not what individual references themselves suggest but rather what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. In re Keller, 648 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Sernaker, 702 F.2d 989, 217 USPQ 1 (Fed. Cir. 1983); In re McLaughlin, 170 USPQ 209 (CCPA 1971). References are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. In re Bozek, 163 USPQ 545 (CCPA 1969).

In re pgs. 10-11, the Appellant argues: "The Examiner further acknowledges that Agrawal does not teach forming packets from the information to be transferred wherein the packets comprise a header and payload. In response to this deficiency, the Examiner suggests that a person skilled in the art would form such packets based on the cited reference La Porta. Applicant submits that it is well known to form a packet having a header and a payload to include sufficient identification of the packet to enable routing of the packet from network element to network element and to different networks. It is this structure of a packet that supports Applicants position that word error rate, according to Agrawal, is not the equivalent of packet error rate as used in the subject application. The term "packetization", as used in Agrawal, does not have the significance that the Examiner places on it.

In response, the Examiner notes that the Appellant concedes that it is well known that forming packets having a header and a payload is well known. Therefore it would be obvious to include a header and a payload for the purpose conveying in the message information describing the destination address (header) where the message (payload) is to be received as stated in the rejection above. If the information in the system of Agrawal is packetized in words, it would be obvious to provide information as to where in the network the information is to be sent and from where the information came from. It could also be argued that having a header and a payload in the packets would be inherent in a system where information is transmitted through a network.

As for the argument that word error rate as described in Agrawal and packet error rate are not equivalent, a packet is the unit of information sent trough the network. Agrawal discloses that data transmission is packetized into words (C1, L48 to C2, L13), and states ""bit error rate... depends on the modulation scheme used", and "Data transmission is usually packetized into words..." (C1, L48-55). As understood, both packets as disclosed by the Appellant and words as disclosed by Agrawal refer to the same thing: the unit of information being transmitted through the network. Therefore, calculating the packet error as disclosed by the Applicant and calculating the word error rate as disclosed by Agrawal relate to the same thing: calculating the error in the units of information transmitted through the network. Moreover, neither the claim nor the specification limit packet error rate to a particular equation, structure or definition.

As for the argument of the term packetization, the Examiner considers this term to mean forming packets of information to send through the network. The Appellant has

not provided evidence that packetization as used in Agrawal does not mean forming packets.

In re pgs. 11-13, the Appellant argues that word error rate and packet error rate are not equivalent. To support his argument, the Appellant argues that in Agrawal, word error rate (WER) is defined in terms of bit error rate (BER). To further support his argument, the Appellant cites articles that indicate that: "this past work illustrated that the BER is not a good indicator of packet error, nor was packet error a useful indicator of BER."

In response, the Examiner notes that there is no explicit definition in the claims or in the specification for packet error rate. Therefore, in the broadest reasonable sense, packet error rate reads on determining errors in blocks of data over a period of time. This means calculating the error associated with the units of information being transmitted through the network. If the system of Agrawal is sending information that has been packetized into words and an error is calculated for these words that are being transmitted, then this error is equivalent to calculating the packet error as claimed by the Appellant.

As for the argument that WER as disclosed by Agrawal is defined in terms of BER and the cited article, it should be noted that the cited portion of the article states that BER is not a good indicator of packet error. The fact that it might not be a good indicator, does not mean that it can not be an indicator of packet error. Clearly a system that detects errors in packets whether at the bit, byte, word, or cell level,

anticipates the limitation of packet error rate. Whether or not bit error rate is a good indicator of how many packets have corrupt bits is not the issue.

In re pg. 13, the Appellant argues that the combination of La Porta and Lewis do not remedy the deficiencies in Agrawal and that there is no prima-facie case of obviousness, the Examiner has explained in the rejection and in the answers to the Appellant's arguments how Agrawal teaches the claims limitations and has provided motivations to combine the references Lewis and La Porta with Agrawal to obtain the invention claimed.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Omar F. Fernández Rivas

Wednesday, October 10, 2007

Conferees:

SPE David Vincent

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